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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/557,282	04/24/2000	Arasanipalai K. Ananthapadmanabhan	PA000275	8121

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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
San Diego, CA 92121-1714

EXAMINER

STORM, DONALD L

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 09/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/557,282

Applicant(s)

ANANTHAPADMANABHAN ET AL.

Examiner

Donald L. Storm

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on April 24, 2000 through January 8, 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 April 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR § 1.83(a) because they fail to clearly show significant features necessary for communicating the invention. See MPEP § 608.02(d). At a minimum, representation of the following features should be added to the drawings to show the claimed invention as a whole:
 - a. weighted value (claim 10 and others);
 - b. previously processed frame (claim 10 and others);
 - c. sum of weights is one (claim 10 and others);
 - d. subtracting and difference value (claim 10 and others);
 - e. currently processed frame (claim 10 and others).
2. The drawings are objected to because lines, annotations, captions, or numbers of Figures 3, 5, and 7 extend into the margin of the sheet too far to be seen clearly. Holes punched into the papers to permanently attach them to the Office file are within the drawings of the Figures. In the case of Fig. 3, part of the drawing, item 202, is obliterated. Correction is required.
3. The drawings are objected to because of the difficulty of determining by the drawings what the Applicant regards as new. See MPEP § 608.02(g).

The many teachings throughout the specification seem to mix discussion of old embodiments shown in the drawings with embodiments of this application. Pages 13-18 provide an example of this mixing. Figures 1-4 are discussed as encoder modules and decoder modules that are known in the art, and they are configured to interface with a conventional PSTN and use

the IS-95 standard. Yet the discussion of Fig. 2, describes exemplary embodiments of data transmission rates as known in the art. Is this intended to be an embodiment regarded as new? Are these embodiments typical and generally implemented in operation of the telephone system?

Can some of the figures be designated by a legend such as --PRIOR ART--? The legend is necessary in order to clarify what Applicant's invention is. Do Figures 1, 2, 3, 4, 6, and 8 show only that which is old? Does the specification refer to anything that the Applicant considers new in these Figures 1, 2, 3, 4, 6, and 8? Are there any other figures that show only that which is old?

4. Corrected drawings (or drawings with proposed corrections highlighted, preferably in red ink) are required in response to this Office action. Corrections may no longer be held in abeyance and ANY REQUEST TO HOLD CORRECTIONS TO THE DRAWINGS IN ABEYANCE WILL NOT BE CONSIDERED A *BONA FIDE* ATTEMPT TO PROVIDE A COMPLETE REPLY.

See 37 C.F.R. § 1.121(d) and § 1.85(a), published September 8 and September 20, 2000.

Specification

5. The title is objected to because it is not sufficiently descriptive of the invention. A new title is required that is clearly indicative of the invention to which the claims are directed. See MPEP § 606.01. The Examiner suggests that the Applicant consider a title including these elements: "Method and Apparatus for Predictively Quantizing Voiced Speech with Subtraction of Weighted Parameters for Previous Frames."

6. The specification is objected to because references to related applications should be made by Application number and filing date. The citations to nonprovisional applications should be

brought up to date if any of the applications have been abandoned or matured into patents, and as appropriate, the application serial numbers or patent numbers should be included. Including titles of the applications is encouraged. References to foreign applications or to applications identified only by the attorney's docket number should be cancelled. See MPEP 608.01 SPECIFICATION.

Correction is required throughout the disclosure, for example:

At page 24, lines 14-16, should the reference to the related application read --Application No. 09/557,283, "Frame Erasure Compensation Method in a Variable Rate Speech Coder," filed April 24, 2000--? Please consider this change for pages 24 and 27 also.

7. The Examiner notes, without objection, the possibility of informalities in the specification. The Applicant may wish to consider changes during normal review and revision of the disclosure.

- a. At page 32, line 22, should the number "09/365,491" be --09/356,491--?
- b. At page 28, line 7, should the reference to "FIG. 8" be --FIG. 7--? Also see page 29, line 6

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Marston

9. Claims 29-31 are rejected under 35 U.S.C. 102(a) as being anticipated by Marston [EP 0 987 680 A1], already of record.

10. Regarding claim 30, Marston [at abstract] describes a speech coder to quantize phase information from speech comprising:

means for generating a modified value of a phase parameter for a frame [at page 9, lines 4-8, as means to modify an initial evolution surface formed from phase representing segments around the predetermined segment];

the frame is a previous frame of speech [at page 5, lines 53-55, as another speech spectrum may precede the spectrum by four sub-frames];

means for applying a number of phase shifts to the modified value [at page 9, line 14 and page 5, line 39-page 7, line 6, as means to carry out filtering steps that evolve the complex values representing phase of consecutive aligned spectra];

means for subtracting the modified value from a value of the phase parameter for a currently processed frame to yield a difference [at Fig. 1, item 14 and page 8, lines 41-43, as WI encoder subtracts phase information of concordant/discordant component from the initial evolution surface formed from phase];

means for quantizing the difference [at page 7, lines 11-16, as the values resulting from the subtraction are forwarded to the quantizer].

11. Claim 29 sets forth a method with limitations comprising the functionality associated with using the apparatus recited in claim 30. Because Marston describes those similar limitations as indicated there, this claim thus is anticipated accordingly.

12. Claim 31 is set forth with limitations similar to claim 30. Marston describes those limitations as indicated there. Marston also describes additional limitations as follows:

a processor [at Fig. 1, items 10, 11, 12, 14 and 16, and microphone, ADC, WI encoder, and quantiser];

a storage medium coupled to the processor and containing a set of instructions executable by the processor [at page 9, line 20, as storage medium having processor-readable, processable code].

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102((e), f) or (g) prior art under 35 U.S.C. 103(a).

Fette and Kleider

15. Claims 1-6, 10-16, and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al. [US Patent 5,255,339] in view of Kleider [US Patent 6,301,265].

16. Regarding claim 10, Fette [at abstract] describes a speech coder to quantize information about speech comprising:

means for generating a value of a parameter for a previous frame of speech [at column 14, lines 57-60, as speech analyzer extracts spectrum, pitch, voicing, and energy of four frames of speech];

the value is a weighted value [at column 11, lines 63-66, as energy and periodicity should be weighted];

the sum of a weights used is one [at column 11, lines 65-68, as the weighted parameters should be summed in the range +1 to -1];

Fette [at column 7, line 59-column 8, line 5] selects and uses different modes of quantization and coding for superframes of up to four speech frames. However, Fette does not explicitly choose a subtraction and difference-coding alternative for the quantization.

Kleider [at column 14, lines 30-37] also describes a speech coder and quantizer. Like Fette, Kleider [at column 4, lines 28-41] selects and uses different modes of quantization and coding for superframes of voicing, pitch, energy, etc. As one of the selectable quantization and coding modes, Kleider describes:

means for subtracting the value from a parameter for a current frame of speech to yield a difference [at column 7, line 67-column 8, line 1, as a delta quantizer characterizes the change from the previous frame]; and

means for quantizing the difference [at column 5, lines 54-56 and column 7, line 67-column 8, line 1, as a delta quantizer implements coding changes since a previous frame].

Both Fette [at column 7, lines 59-63] and Kleider [at column 1, lines 21-23] describe solutions to effective coding of speech using alternative quantization methods to adapt the transmission rate. Both Fette and Kleider use a superframe constructed from sequences of speech frames. In view of the commonalities of Fette and Kleider, it would have been obvious to one of ordinary skill in the art of speech coding at the time of invention to include Kleider's concept of delta coding for superframe parameters as a choice for coding Fette's superframe. Using Kleider's concept with Fette at would provide an advantageous alternative because Kleider [at column 2, lines 36-59] points out that it controls bit rate based on network conditions and allows graceful degradation with packet errors.

17. Claim 11 is set forth with limitations similar to claim 10. Fette and Kleider describe and make obvious those limitations as indicated there, where Fette's and Kleider's quantizer and coder are infrastructure elements.

18. Claim 12 is set forth including the limitations of claim 11. Fette and Kleider describe and make obvious those limitations as indicated there. Fette also describes additional limitations as follows:

one value of the parameter is for the immediately preceding frame, and has a weight equal to one [at column 14, lines 34-36, as suspect information is replaced by clamping it at the value of the preceding frame].

19. Claim 13 is set forth including the limitations of claim 11. Fette and Kleider describe and make obvious those limitations as indicated there. Fette also describes additional limitations as follows:

the speech is voiced [at column 13, line 48, as voiced frames].

20. Claim 14 is set forth including the limitations of claim 11. Fette and Kleider describe and make obvious those limitations as indicated there. Fette also describes additional limitations as follows:

the parameter is a pitch lag value [at column 1, lines 43-44, as pitch period].

21. Claim 15 is set forth including the limitations of claim 11. Fette and Kleider describe and make obvious those limitations as indicated there. Fette also describes additional limitations as follows:

the parameter is an amplitude value [at column 11, lines 63-64, as low-frequency energy].

22. Claim 16 is set forth including the limitations of claim 11. Fette and Kleider describe and make obvious those limitations as indicated there. Fette also describes additional limitations as follows:

compute the value for the current frame of speech [at column 14, lines 57-60, as speech analyzer extracts spectrum , pitch, voicing, and energy of four frames of speech].

23. Claims 1-6 set forth a method with limitations comprising the functionality associated with using the apparatus recited in claims 11-16. Because Fette and Kleider describe and make obvious those similar limitations as indicated there, these claims thus are unpatentable accordingly.

24. Claims 20-25 are set forth with limitations similar to claims 11-16 respectively. Fette and Kleider describe and make obvious those limitations as indicated there. Fette also describes additional limitations as follows:

a processor [at column 5, lines 33-34, as microprocessor]; and
a storage medium coupled to the processor and containing instructions executable by the processor [at column 5, lines 34-38, as microprocessor acts to execute instructions stored in ROM].

Fette and Kleider and Marston

25. Claims 7-9, 17-19, and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al. [US Patent 5,255,339] in view of Kleider [US Patent 6,301,265] and further in view of Marston [EP 0 987 680 A1].

26. Claim 17 is set forth including the limitations of claims 11 and 16. Fette and Kleider describe and make obvious those limitations as indicated there.

Fette [at column 7, lines 8-19] also describes spectral information in terms of LPC analysis and conversion among representative speech parameters.

However, neither Fette nor Kleider explicitly obtains and represents a pitch period prototype in a frequency domain representation.

Like Fette, Marston [at page 2, lines 3-4] also describes a digital speech coder that makes use of voiced/unvoiced speech decisions in low bit rate coding. Marston's quantizing and coding units are frames, but parameters are analyzed in four subframe units. Marston also uses a pitch parameter, and describes pitch-based speech analysis, including::

extract a pitch period prototype for the current frame of speech [at page 5, lines 8-10, as obtain a characteristic waveform for each one of four subframes of length equal to the pitch period]; and

obtain a frequency-domain representation of the pitch period prototype [at page 5, lines 24-25, as produce a characteristic DFT spectrum representing the characteristic waveform].

Marston's [at abstract] advantage is truer reproduction of original speech because of analysis and synthesis by pitch-based timing. In view of the common features of Fette's and Marston's quantization and coding, it would have been obvious to one of ordinary skill in the art of speech coding at the time of invention to augment Fette's LPC analysis with Marston's concept of pitch period waveforms from LPC analysis because Marston points out that the pitch-timed analysis is better able to approximate the original input speech.

27. Claim 18 is set forth including the limitations of claims 11 and 16. Fette and Kleider describe and make obvious those limitations as indicated there.

Fette [at column 7, lines 8-19] also describes spectral information in terms of LPC analysis and conversion among representative speech parameters.

However, neither Fette nor Kleider explicitly obtains a short-term frequency domain representation.

Like Fette, Marston [at page 2, lines 3-4] also describes a digital speech coder that makes use of voiced/unvoiced speech decisions in low bit rate coding. Marston's quantizing and coding units are frames, but parameters are analyzed in four subframe units. Marston also uses a pitch parameter, and describes pitch-based speech analysis, including:

calculate a short-term frequency-domain representation of the current frame [at page 5, lines 24-25, as produce a characteristic DFT spectrum representing the characteristic waveform for each subframe].

Marston's [at abstract] advantage is truer reproduction of original speech because of analysis and synthesis by pitch-based timing. In view of the common features of Fette's and Marston's quantization and coding, it would have been obvious to one of ordinary skill in the art of speech coding at the time of invention to augment Fette's LPC analysis with Marston's concept of pitch period waveforms from LPC analysis and represented in the DFT frequency domain because Marston points out that the pitch-timed analysis is better able to approximate the original input speech.

28. Claim 19 is set forth including the limitations of claims 11, 16, and 18. Fette, Kleider, and Marston describe and make obvious those limitations as indicated there. Marston also describes:

29. decompose the short-term frequency-domain representation into amplitude and phase vectors [at page 5, lines 42-50, as represent the magnitude of the complex spectral values and represent the argument of the complex spectral values as phase].

30. Claims 7-9 are set forth including the limitations of claims 1 and 6 and with limitations comprising the functionality associated with using the apparatus recited in claims 17-19, respectively. Because Fette, Kleider, and Marston describe and make obvious those similar limitations as indicated there, these claims thus are unpatentable accordingly.

31. Claims 26-28 are set forth including the limitations of claims 20 and 25 and with additional limitations similar to limitations recited in claims 17-19 respectively. Fette, Kleider, and Marston describe and make obvious those limitations as indicated there.

Conclusion

32. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703)872-9314, (for formal communications intended for entry)

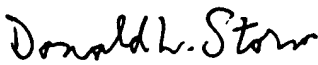
Or:

(703)872-9314, (for informal or draft communications, and please label
"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal
Drive, Arlington, VA., Sixth Floor (Receptionist).

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald L. Storm, of Art Unit 2654, whose telephone number is (703)305-3941. The examiner can normally be reached on weekdays between 8:00 AM and 5:00 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (703)305-4379. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office at telephone number (703)306-0377.

August 31, 2002


Donald L. Storm
Patent Examiner
Art Unit 2654